

## Claims

- [c1] 1. A power adapter having a freely rotatable direct current (DC) plug connection, comprising:  
a main body, including a casing that respectively encloses an adapter circuit board, a DC connector port and an alternating current (AC) connector port, the DC connector port and the AC connector port being respectively arranged on the adapter circuit board;  
a DC wire, having a first terminal electrically connected to a DC plug that mates with the DC connector port according to a freely rotatable manner; and  
an AC wire, having a second terminal electrically connected to the AC connector port.
- [c2] 2. The power adapter of claim 1, wherein the casing further includes an opening at a location corresponding to that of the DC connector port on the adapter circuit board.
- [c3] 3. The power adapter of claim 2, wherein the DC plug further comprises:  
an electrical connecting part, mating with the DC connector port; and  
an insulating part, partially covering the electrical connecting part, the insulating part being further provided with a slot that engages by fitting with a rim of the opening of the casing in a manner to allow a free rotation of the DC plug relative to the casing while ensuring the electrical and mechanical connection there between.
- [c4] 4. The power adapter of claim 3, wherein the insulating part further includes a stress-buffer structure.
- [c5] 5. The power adapter of claim 1, wherein the casing is formed in an approximately parallelepiped shape.
- [c6] 6. The power adapter of claim 1, wherein the casing is formed in an approximately parallelepiped shape and further includes at least a recessed cavity.
- [c7] 7. The power adapter of claim 6, wherein the DC plug freely and rotatably connects the casing within the recessed cavity.

- [c8] 8. The power adapter of claim 1, wherein a third terminal of the DC wire further connects an output plug.
- [c9] 9. The power adapter of claim 1, wherein a fourth terminal of the AC wire connects a plug.
- [c10] 10. A freely rotatable electrical connection structure of an electrical device, comprising:  
an electrical device, having a casing in which is arranged a direct current (DC) connector port and through which is defined an opening; and  
an electrical plug, including an electrical connecting part and an insulating part, the electrical connecting part rotatably mating with the DC connector port, and the insulating part further including a slot that engages by fitting with a rim of the opening of the casing in order to secure the connection between the electrical plug and the DC connector port while allowing a free rotation there between.
- [c11] 11. The connection structure of claim 10, wherein the insulating part further includes a stress-buffer structure.